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ABSTRACT

The present report is one in a series which profiles the University of Washington (UW) entering freshman class in terms of performance on the several tests making up the Washington Pre-College Testing Program's battery. As in earlier years, percentile charts for male and female entrants as well as for the total tested group, comprising 79 percent of all UW freshmen are included for the use of academic advisors and counselors. The group studied is the first one admitted to UW under new admissions standards requiring the use of an academic aptitude test in determining admissibility. The distribution of the Admission Index (AI) values used in making admissions decisions is reported and the impact of the test requirement on tested aptitude of entrants discussed. It is tentatively concluded that use of the AI and preferential admission of high aptitude students has led to a relative increase in the tested aptitude of the freshmen class. (Author/BJG)

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The present report is one in a series which profiles the UW entering freshman class in terms of performance on the several tests making up the Washington Pre-College Testing Program's battery. As in earlier years, percentile charts for male and female entrants as well as for the total tested group (comprising 79% of all UW freshmen) are included for the use of academic advisors and counselors. The group studied is the first one admitted to UW under new admissions standards requiring the use of an academic aptitude test in determining admissibility. The distribution of the Admission Index (AI) values used in making admissions decisions is reported and the impact of the test requirement on tested aptitude of entrants discussed. It is tentatively concluded that use of the AI and preferential admission of high aptitude students has led to a relative increase in the tested aptitude of the freshman class.

Educational Assessment Center Project: 277.

Washington Pre-College Test Norms and Admission's Index Data for University of Washington Freshmen Entering Autumn 1974

Virginia A. de Wolf

Beginning Autumn Quarter 1974 the University of Washington (UW) required all freshman applicants to submit scores from an academic aptitude test, such as the Scholastic Aptitude Test (SAT), American College Test (ACT), or the Washington Pre-College (WPC) Test, as well as their high school transcript. Test scores and high school grades were then used to compute for each applicant an Admission's Index (AI), a linear combination of the student's verbal and quantitative composite scores from the SAT or WPC (or the "total" score from the ACT) and the overall high school grade point average (GPA). The rationale for computation of the AI is given in Lunneborg (Note 1). Offers of admission were first extended to those applicants with higher AI scores. The bulk, approximately 79%, of the freshmen who did enter Autumn Quarter 1974 presented WPC test scores, 16% reported either SAT or ACT results and the remaining 5% were admitted without test data (Note 2). This report discusses data relating only to those 2,694 students who participated in the WPC program.

The distribution of AI scores is presented in Figure 1. There were not any striking differences between the distributions obtained for male and female entrants. The range of AI scores is from 29 to 92. Since WPC data were available for a number of EOP and other discretionary admittees, Figure 1 includes 333 freshmen (151 females and 182 males) with WPC based AI scores below 64, the minimum for regular admissions to the Fall 1974 class.

Most of this group of students were tested as high school juniors in spring of 1973 with Form C of the WPC battery normed on a sample of 1973 high school juniors. The nine WPC subtests (Washington Pre-College Testing Program, Note 3) can be briefly described:

Vocabulary - knowledge of the meaning of words;

English Usage - knowledge of rules of grammar, word usage, capitalization and punctuation;

Spelling - ability to identify misspelled words;

Reading Comprehension - ability to extract information from short paragraphs;

Quantitative Skills - skill in handling quantitative data and in observing relationships between quantities;

Applied Mathematics - ability to solve applied arithmetic and elementary algebra problems;

Mathematics Achievement - knowledge of algebra and geometry;

Spatial Ability - ability to visualize transformations in three dimensions; and

Mechanical Reasoning - ability to understand physical principles as applied to mechanical devices.

The Verbal Composite score is a weighted average of the Vocabulary, English Usage, Spelling, and Reading Comprehension test scores and the Quantitative Composite is a weighted average of scores on the Quantitative Skills, Applied Mathematics, and Mathematics Achievement tests. With the introduction of WPC Form C a Reading Speed score was eliminated and students were given the option of writing one of two forms of the Mathematics Achievement test. The upper form was designed for students having three or more semesters of high school algebra and the lower for students with less preparation. A single standard score scale, however, was developed to encompass performance on either test.

Percentile charts of high school GPAs, WPC scores, and AI's are given by Tables 1-3 for the total, female, and male groups, respectively, of students entering the UW in Autumn Quarter 1974. The seven GPA's (overall, English, foreign language, social science, mathematics, natural science, and elective) were rounded to the nearest tenth and decimal points omitted in the tables. The WPC tests and composite scores are all reported in standard score form, i.e., all have a mean of 50 and a standard deviation (SD) of 10 in the high school junior group participating in the WPC program, essentially all college bound students. The AI, as noted in Table 4, had a mean of nearly 73 in the group of enrollees.

These percentile charts are presented each year for the use of freshman advisors and counselors. By plotting a student's high school GPA, WPC scores, and AI against the norms for the entering class, a student can easily

see the percentage of the group earning scores equal to, or below that of the student. As an example, a woman entering as a freshman with a WPC Mechanical Reasoning score of 61 would discover from Table 1 that she had a score equal to or greater than those of 75% of the total group of entrants and from Table 2 that her score was equal to or greater than those of 95% of the female group on this subtest. By plotting her scores in all of the other 18 areas she could see how her academic aptitude compared with the other members of her entering freshman class. The complete WPC profile, along with other pertinent information such as vocational interest(s) of the student, can be useful to a counselor or advisor in guiding a student. For an illustrative example in plotting such a profile see de Wolf (Note 4).

Table 4 indicates the means and SDs for the 7 GPA's, 11 WPC scores, and AI for the total, female, and male groups. The female means surpassed the male means on all of the high school GPA's except that in mathematics, on all of the WPC verbal scores except Reading Comprehension, and on the AI. The male group of entrants had superior means on all of the WPC quantitative tests, Spatial Ability, and Mechanical Reasoning.

There cannot be complete assurance that Form C of the WPC battery is strictly equivalent to earlier forms, although much effort was expended to select test items in the same way as for earlier tests. Therefore, some caution is necessary in making inferences based on a comparison of data reported for Form C with normative data based on earlier WPC forms. With this caution in mind, however, it may be instructive to ask if there have been trends in WPC scores of UW entering freshmen, or to see what may have been the impact of initiating the AI requirement. Figures 2 and 3 report some data relevant to these issues. Figure 2 charts the "WPC mean difference scores" for the WPC verbal measures for classes entering 1970 to 1974 while Figure 3 does the same for the WPC quantitative, spatial and mechanical reasoning measures.

The mean difference score is the difference between the average score for freshmen entering UW for a given Fall Term (who had also taken the WPC test) and the average earned by all high school juniors writing the WPC battery a year earlier. This difference, when positive, can be interpreted, roughly, as the amount by which the performance of the typical UW freshman exceeds the performance of the typical college bound student. As an example,

the difference between the mean of the Vocabulary test for the Autumn 1970 entering freshman class, 54.2, and the mean for the entire group of high school juniors who took the WPC battery in spring 1969 (when the majority of these UW entrants would have been tested), 48.6, is 5.6. This difference is the "WPC mean difference score" for the 1970 entrants on Vocabulary plotted in Figure 2. Similar "difference scores" for all WPC measures for each of five entering freshman classes were computed and plotted in Figures 2 and 3.

How can these apparent trends be interpreted? The reader will want to keep in mind that somewhat different forms of the WPC test were used over the years; that varying proportions of UW freshmen completed the tests (98% in 1970, 94% in 1971, 78% in 1972, 81% in 1973, and 79% this past fall); and that the high school juniors tested each year may be differentially representative of all high school juniors. First, all of the "difference scores" are in a positive direction, that is, the mean score of each UW entering class in each of the 5 years was greater on each test than the mean for the corresponding norm group. There was a decrease in the "difference scores" from 1970 to 1973 followed by an increase in 1974 on six WPC measures: Vocabulary, Reading Comprehension, Verbal Composite, Quantitative Skills, Applied Mathematics, and Spatial Ability. The 1974 "difference score," however, did not surpass the previous 1970 "high" on any of these WPC measures and only for Verbal Composite are the two equal. On the following WPC measures no pattern of 1970 to 1973 "difference scores" is discernible: English Usage, Spelling, Mathematics Achievement, and Quantitative Composite. What unites these four, however, is that their 1974 "difference scores" are greater than any of the earlier years' "difference scores." Only in the Mechanical Reasoning "difference scores" can a drop between the years of 1973 and 1974 be noted. The drop is slight, however, from 3.1 to 3.0. There is in these data the most tentative suggestion that the introduction of the AI has led to an increase in tested aptitude (relative to the high school supply) for this most recent group of freshmen when compared with the immediately preceding years

Reference Notes

1. Lunneborg, C. E. Summarization of empirical findings on new freshman admissions index (Project Report #254 and 255). Seattle: Educational Assessment Center, University of Washington, January 1974.
2. Furlan, J. Personal communication, May 7, 1975.
3. Washington Pre-College Testing Program. WPC Career Planner. Seattle: Author, 1974.
4. de Wolf, V. Washington Pre-College test norms for University of Washington freshmen entering autumn 1972 (Project #246). Seattle: Educational Assessment Center, University of Washington, March 1974.

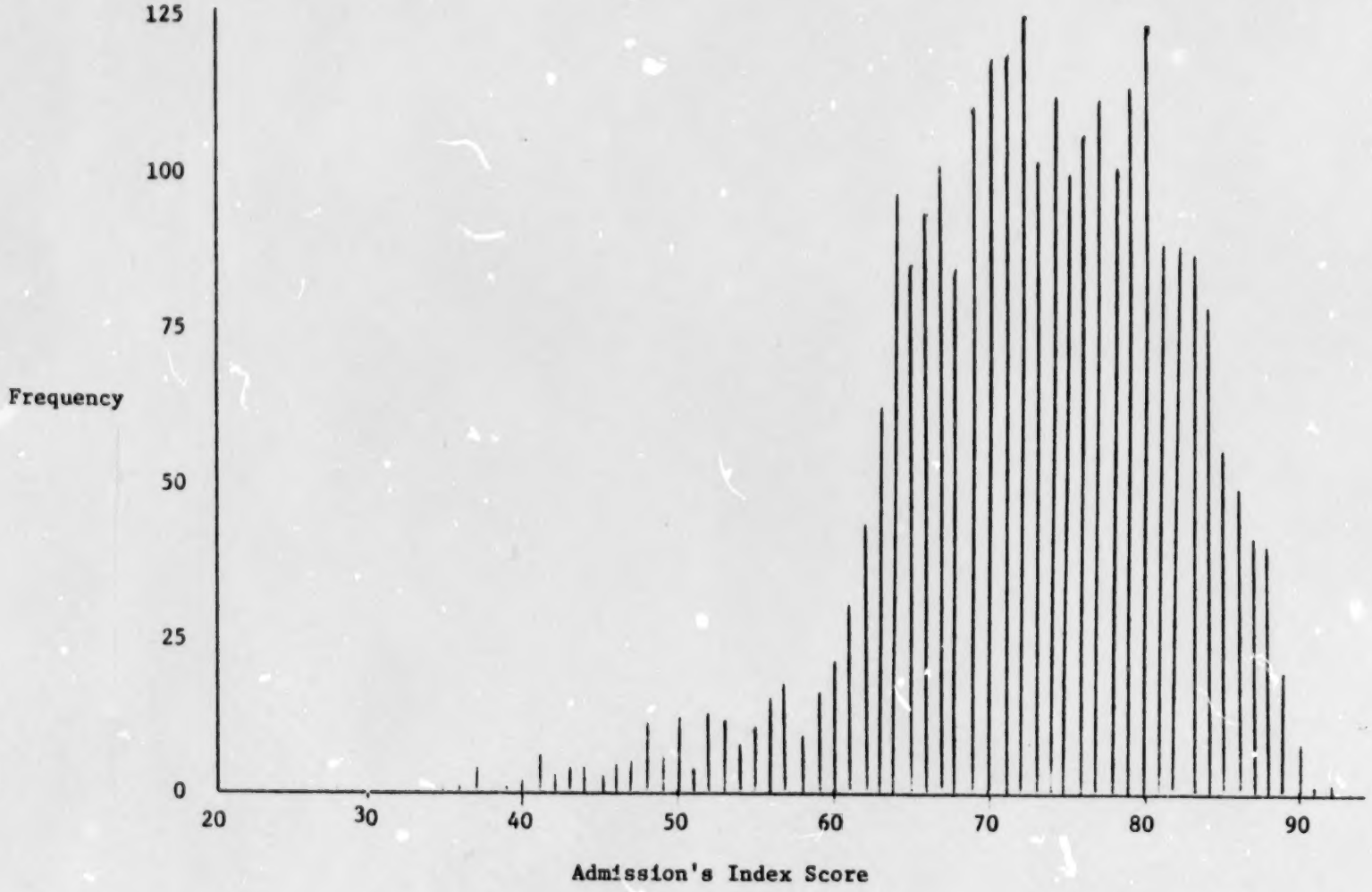

Figure 1. Frequency of Admission's Index scores for freshman entrants, Autumn Quarter 1974, who took the WPC. (N = 2,694)

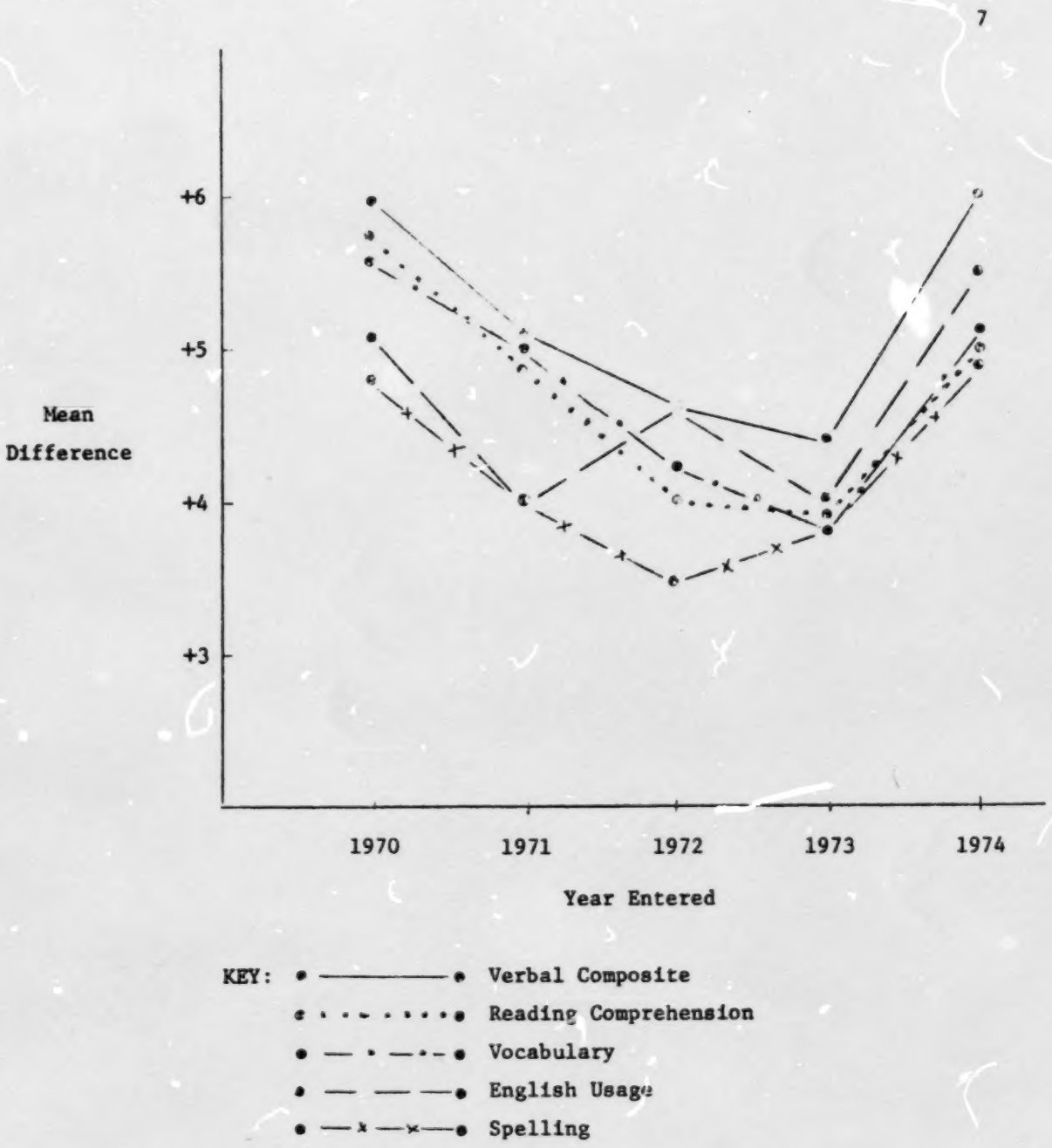

Figure 2. WPC verbal scores: Difference between mean of UW freshmen and mean of comparable norm group, 1970-1974 Autumn Quarter entrants.

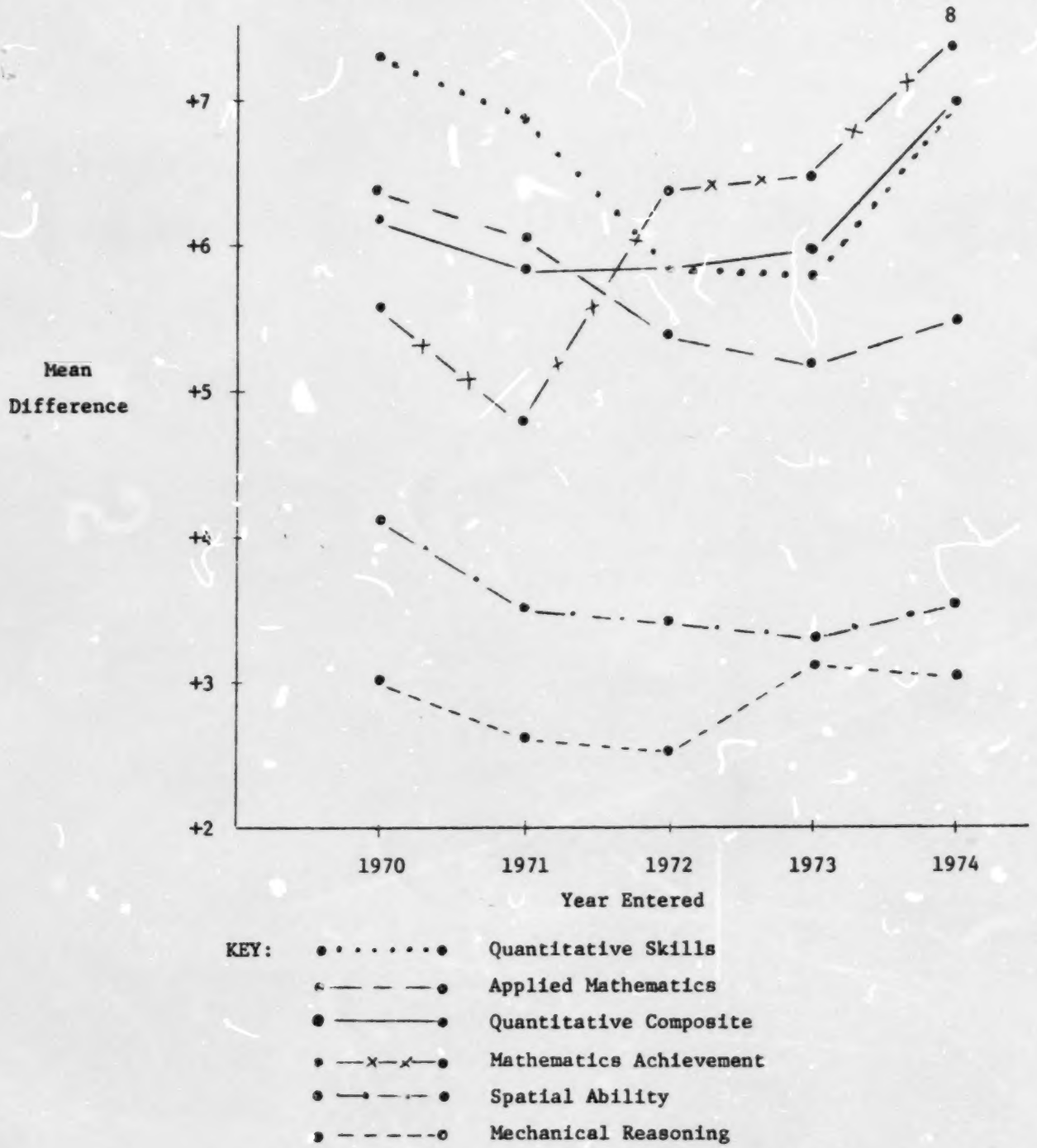

Figure 3. WPC quantitative, spatial, and mechanical reasoning scores: Difference between mean of UW freshmen and mean of comparable norm group, 1970-1974 Autumn Quarter entrants.

Table 1

PERCENTILE CHART FOR FRESHMEN ENTERING U OF W AUTUMN, 1974* (All Students)

The percentiles at the left indicate the approximate percent of freshmen whose high school GPA's, test scores, and admissions indices fell below the values in the body of the table. Percentiles for the nineteen measures are based on 2,694 (1,360 males, and 1,334 females) entering U of W as freshmen in Autumn Quarter 1974.

	HIGH SCHOOL GPA's OMITTING DECIMALS (Based on 6 semesters only)							WASHINGTON PRE-COLLEGE TEST SCORES (Standard Scores Are Based on HS Juniors, Male and Female)											ADMISSIONS INDEX	
PERCENTILE	Over All	Engl	For Lang	Soc Sci	Math	Nat Sci	Elect	Voc	Engl Usage	Engl Spell	Read Comp	Verb Com	Quant Skills	Appl Math	Math Ach	Quant Com	Spat Abil	Mech Reas		PERCENTILE
**(max)	40	40	40	40	40	40	40	72	79	70	63	76	72	67	81	75	67	68	93	(max)
98	40							72	73	70	68	71	70	67	74	71	67	68	88	98
95	39							70	70	68	66	69	68	67	70	69	67	68	86	95
91	39	40			40			68	68	66	64	67	67	65	68	67	65	66	84	91
84	38	39		40	38	40	40	65	64	65	63	65	65	65	66	66	64	63	82	84
75	37	38	40	38	37	38	39	62	61	60	61	62	63	63	62	63	60	61	80	75
63	36	37	37	37	34	36	38	58	58	59	58	59	60	59	60	60	58	56	77	63
50	34	35	35	35	31	34	37	55	55	55	55	56	58	57	57	57	55	52	73	50
37	33	33	32	34	28	31	35	51	51	52	51	52	54	53	54	54	51	50	70	37
25	32	31	30	32	26	30	33	48	47	48	48	49	51	49	52	51	47	45	67	25
16	30	29	26	30	24	26	30	44	45	44	45	45	47	45	47	47	42	42	65	16
9	29	27	24	27	21	24	29	41	41	40	39	42	42	40	44	43	37	38	62	9
5	27	25	20	25	18	20	26	39	38	38	37	39	39	37	40	39	35	35	57	5
2	24	20	16	20	15	16	21	34	34	34	31	35	34	31	33	33	34	33	49	2

*Data from high school juniors tested in spring of 1973 and seniors tested in fall of 1973. Data from this chart were obtained solely from Form C.

**Top GPA's, Standard Scores, and Admission's Index respectively

Table 2

PERCENTILE CHART FOR FRESHMEN ENTERING U OF W AUTUMN, 1974* (Female Students)

The percentiles at the left indicate the approximate percent of female freshmen whose high school GPA's, test scores, and admissions indices fell below the values in the body of the table. Percentiles for the nineteen measures are based on 1,334 females entering as U of W freshmen in Autumn Quarter 1974

	HIGH SCHOOL GPA's OMITTING DECIMALS (Based on 6 semesters only)							WASHINGTON PRE-COLLEGE TEST SCORES (Standard Scores Are Based on HS Juniors, Male and Female)											ADMISSIONS INDEX	
PERCENTILE	Over All	Engl	For Lang	Soc Sci	Math	Nat Sci	Elect	Voc	Engl Usage	Spell	Read Comp	Verb Com	Quant Skills	Appl Math	Math Ach	Quant Com	Spat Abil	Mech Reas		PERCENTILE
**(max)	40	40	40	40	40	40	40	72	79	70	68	76	72	67	81	75	67	68	93	(max)
98	40							72	73	70	68	72	69	67	72	69	67	65	88	98
95	39							70	70	69	66	70	67	65	67	67	65	61	86	95
91	39				40			68	68	67	64	68	65	65	65	65	64	58	84	91
84	38	40		40	38	40		65	66	65	63	65	63	62	63	63	62	57	82	84
75	37	38	40	39	35	38	40	62	62	63	61	63	60	59	60	60	59	54	80	75
63	36	37	38	38	33	36	38	58	60	60	58	60	58	56	58	58	56	51	77	63
50	35	36	36	36	30	35	37	54	57	57	55	57	55	53	55	54	52	46	74	50
37	34	35	34	34	28	31	35	50	53	54	51	53	51	49	52	51	49	45	71	37
25	32	33	30	32	25	30	34	48	48	51	48	50	48	45	48	48	45	41	68	25
16	31	31	30	30	24	26	32	43	46	47	45	46	44	43	45	44	41	39	65	16
9	29	29	26	27	21	23	30	39	42	43	39	42	40	38	41	41	37	35	63	9
5	28	27	23	25	19	20	28	37	40	40	37	39	38	35	38	38	33	34	56	5
2	24	21	21	20	14	15	23	33	34	36	30	35	34	31	33	33	33	33	49	2

*Data from high school juniors tested in spring of 1973 and seniors tested in fall of 1973. Data from this chart were obtained solely from Form C.

**Top GPA's, Standard Scores, and Admission's Index, respectively.

Table 3

PERCENTILE CHART FOR FRESHMEN ENTERING U OF W AUTUMN, 1974* (Male Students)

The percentiles at the left indicate the approximate percent of male freshmen whose high school GPA's, test scores, and admissions indices fell below the values in the body of the table. Percentiles for the nineteen measures are based on 1,360 males entering as U of W freshmen in Autumn Quarter 1974.

	HIGH SCHOOL GPA's OMITTING DECIMALS (Based on 6 semesters only)							WASHINGTON PRE-COLLEGE TEST SCORES (Standard Scores Are Based on HS Juniors, Male and Female)												ADMISSIONS INDEX	
PERCENTILE	Over All	Engl	For Lang	Soc Sci	Math	Nat Sci	Elect	Voc	Engl Usage	Spell	Read Comp	Verb Com	Quant Skills	Appl Math	Math Ach	Quant Com	Spat Abil	Mech Reas			PERCENTILE
**(max)	40	40	40	40	40	40	40	72	79	70	68	76	72	67	81	75	67	68		93	(max)
98	40							71	72	68	68	70	71	67	75	72	67	68		88	98
95	39	40						70	68	66	66	68	69	67	73	70	67	68		86	95
91	38	39			40			68	66	65	64	66	68	67	70	68	65	68		84	91
84	37	38	40	40	38	40	40	65	63	62	63	64	67	65	67	67	65	66		82	84
75	36	37	38	38	37	38	39	63	59	59	61	62	65	65	65	65	64	63		79	75
63	35	35	35	36	34	36	37	59	57	56	58	58	63	63	62	63	60	62		76	63
50	34	33	33	35	32	34	36	56	53	53	57	55	59	59	59	60	57	59		73	50
37	32	32	30	33	29	31	34	52	50	48	52	51	57	56	56	57	54	56		70	37
25	31	30	28	31	26	30	32	48	46	46	48	48	54	53	54	55	48	52		67	25
16	30	28	25	29	24	27	30	46	43	42	45	45	50	49	51	51	43	48		64	16
9	28	26	22	26	21	24	27	42	40	38	39	41	46	44	47	47	39	45		62	9
5	26	24	20	24	18	20	25	39	38	36	37	39	41	39	43	43	35	41		57	5
2	23	19	16	20	16	15	21	34	34	32	31	34	34	33	35	35	34	36		49	2

*Data from high school juniors tested in spring of 1973 and seniors tested in fall of 1973. Data from this chart were obtained solely from Form C.

**Top GPA's, Standard Scores, and Admission's Index, respectively.

Table 4

Means and Standard Deviations of WPC Tests and Related Data

High School GPA's	Total (N=2,694)		Female (N=1,334)		Male (N=1,360)	
	Mean	SD	Mean	SD	Mean	SD
Overall	3.38	.42	3.44	.39	3.32	.46
English	3.41	.48	3.52	.44	3.30	.50
Foreign Language	3.33	.63	3.46	.58	3.19	.70
Social Science	3.44	.53	3.48	.55	3.39	.57
Mathematics	3.05	.71	3.02	.70	3.08	.72
Natural Science	3.28	.67	3.29	.67	3.28	.63
Electives	3.53	.48	3.59	.47	3.46	.55
Washington Pre-College Test Scores						
Vocabulary	54.4	10.0	53.8	10.3	55.0	9.6
English Usage	54.4	9.6	55.7	9.9	53.0	9.7
Spelling	54.1	9.5	56.1	9.0	52.1	9.8
Reading Comprehension	53.9	9.5	53.8	9.5	54.0	9.4
Verbal Composite	55.0	9.5	55.8	9.3	54.3	9.2
Quantitative Skills	56.1	9.0	53.7	9.3	58.3	9.0
Applied Mathematics	54.7	9.5	52.0	9.6	57.3	8.8
Mathematics Achievement	56.5	9.1	54.0	9.2	58.8	9.3
Quantitative Composite	56.1	9.4	53.4	9.1	58.8	8.5
Spatial Ability	53.1	9.9	51.4	9.4	54.8	10.0
Mechanical Reasoning	52.5	9.9	47.4	8.5	57.5	8.6
Admission's Index	72.75	9.13	73.13	9.05	72.37	9.19